

REMARKS

Applicant hereby requests further consideration of the present application in view of the amendments above and the comments that follow. This response is submitted in reply to the Final Office Action dated June 2, 2005 ("the Action") with a Request for Continued Examination ("RCE").

I. Allowed Claims

Applicant acknowledges, with appreciation, the Examiner's allowance of Claims 9, 10 and 12-27.

II. The Rejected Claims

The Action rejects Claims 1-8 and 11 under 35 USC §102(e) as being anticipated by U.S. Patent Publication No. 2003/0068987 to Dufosse et al. ("Dufosse"). The Action also rejects Claims 3 and 6-8 as being obvious based on Dufosse in view of U.S. Patent No. 6,496,149 to Birnbaum et al. ("Birnbaum"), and U.S. Patent No. 6,693,596 to Wakui et al. ("Wakui"), respectively. Applicant respectfully disagrees.

Dufosse proposes an acoustic transducer that is located in an antenna cavity. A patch antenna is on the top surface of the cavity 45 with a slot 44 open to the rear of the device (facing away from the display 20). The ground plane 41 of the antenna must be perforated (see reference number 49) to allow air and sound waves between the membrane 33 and rear cavity 32 to circulate (para. 37, 38). The conventional antenna cavity is larger than the conventional acoustic cavity.

In contrast, embodiments of the present invention provide an antenna in or on an acoustic cavity, with the acoustic channel open in the front of the device on the same side as the display (which is particularly suitable for GPS applications). In particular embodiments, the acoustic channel can be generally tubular with about 10 mm or less in width and about 50 mm or less in length (*see, e.g.*, specification, p. 8, lines 9-15). *See* New Claims 28-30.

The rejected independent claims, Claims 1 and 11, are restated below for discussion.

1. An antenna subassembly comprising an integrated antenna and acoustic channel having a resonant frequency of operation, comprising:
an acoustic channel formed of substrate material, the acoustic channel having a wall with an enclosed space and an associated length and width and opposing upper and lower end portions, the acoustic channel adapted, during operation, to guide the sound output of a speaker to a target location; ~~and~~
an antenna that is integrated with the acoustic channel;
a speaker in communication with the acoustic channel and disposed proximate the lower end portion of the acoustic channel; and
a printed circuit board having forward and rearward primary surfaces and an aperture extending therethrough, the acoustic channel upper end portion merging into or extending through the printed circuit board aperture to guide the sound output from the speaker to exit in a forward direction.

11. A wireless terminal, comprising:
(a) a housing with opposing forward and rearward primary surfaces configured to enclose a transceiver that transmits and receives wireless communications signals;
(b) an acoustic channel having a wall with an enclosed space and an associated length and width with opposing first and second end portions, wherein the acoustic channel is configured as an elongate channel;
(c) an antenna having an associated radiating element, wherein at least a portion of the element is in and/or on the acoustic channel;
(d) a display screen having a perimeter disposed in the housing to be externally viewable from a forward primary surface of the housing;
(e) a speaker in the housing in communication with the acoustic channel, the acoustic channel adapted, during operation, to guide the output of the speaker out of a forward location of the wireless terminal at a location that is outside the perimeter of the display screen.

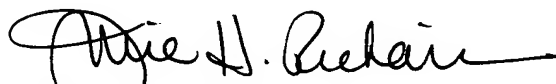
Applicants respectfully submit that the claims are patentable for the inclusion of at least the emphasized recitations. Further, Applicant respectfully directs the Examiner's attention to the dependent claims (including new Claims 28-30), which recite independently patentable features, such as the tubular shape of the acoustic channel, the enclosed space, the configuration of the acoustic channel to output the sound, and the like.

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III. Conclusion

Accordingly, Applicants submit that the present application is in condition for allowance and the same is earnestly solicited. The Examiner is encourage to telephone the undersigned at 919-854-1400 for resolution of any outstanding issues.

Respectfully submitted,



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Joyce Paoli